Recycling Policy for the United States

Lithium-ion batteries are relatively safe for the environment, though it is important to exercise proper caution and care when recycling a battery of this nature. The contents of these batteries are under pressure, thus having the potential to cause accidents and injury if the user is not careful.

Like most rechargeable batteries, the overall life gradually decreases with every discharge and recharge, but they all inevitably reach the point where they are no longer useable in the original application. One form of recycling is to repurpose the battery for a different application that can benefit from the amount of energy still available in the battery. Having a second life use is the most economical form of recycling. Once your lithium-ion battery is completely dead however, it is time to consider replacing and recycling it.

Although lithium-ion batteries pose a significantly lesser threat than many other batteries, it is still important to recycle them. Even at the end of life of lithium ion batteries, they can pose the risk of personal injury, property damage and environmental damage if not properly recycled or disposed. For these reasons the recycling and disposal of lithium ion batteries is generally regulated by national, state and local regulations. Therefore, improper disposal or recycling may be illegal if not properly performed.

The preferable method to recycle/dispose of these batteries is to utilize the services of a recycling center familiar with the disposal regulations. Plenty of these centers exist in the United States. These places disassemble the batteries in a manner that prevents any harm to people, property and the environment. Once disassembled, the individual parts and materials may then be recycled and reassembled into new materials. A number of companies accept lithium-ion batteries for recycling, making the recycling process relatively simple.

**Recycling Steps:**

1. Identify a recycling center (see pages 2 & 3 for listings).
2. Prepare the battery as stated in this guide as well as follow any instructions given by the recycler.
3. If you are shipping the battery to a recycler, please be aware that it must be shipped in compliance with the applicable governmental regulations which include that it be appropriately packaged, shipped via ground and labeled as hazardous waste.
If you have additional questions concerning packaging, placarding, shipping bill requirements, or proper DOT descriptions, please contact the recycling center of choice for assistance.

**Recycling Locations**

Please call one of these battery recycling companies to get the proper and current ship-to address as well as quotes on what they might charge. Let them know you would like to send them a Valence battery (including Voltage, Ah, and Wh rating), which is made up of hundreds of 18650 or 26650 cells using lithium iron phosphate chemistry. Some may require the shipper to fill out a Customer Profile Sheet, which they will provide. Others may even be equipped to supply national freight and logistic services. Valence has no direct affiliation with any of these recyclers.

**North America:**

Inmetco  
[www.inmetco.com](http://www.inmetco.com)  
The International Metals Reclamation Company, Inc.  
One INMETCO Drive  
Ellwood City, PA 16117  
724-758-5515

MPS Trading  
2920 Scotten Street  
Detroit, MI 48210  
313-841-7588

TOXCO  
[http://www.retrievtech.com/recycling/lithium-ion](http://www.retrievtech.com/recycling/lithium-ion)  
9384 Highway 22A  
Trail, British Columbia, Canada V1R 4W6  
250-367-9882

Metal Conversion Technologies  
1 East Porter Street  
Cartersville, GA 30120  
678-721-0022
Heritage-Crystal Clean
Corporate Office
http://www.crystal-clean.com
2175 Point Blvd, Suite 375
Elgin, IL  60123
877-938-7948

BlueSky Solutions
Corporate Office
www.blueskysolutions.us
309 Chapanoke Rd
Suite 114
Raleigh, NC 27603
919-771-0744

BlueSky Solutions
www.blueskysolutions.us
5019 Hovis Rd
Suite G
Charlotte, NC 28208
704-412-9677

BlueSky Solutions
www.blueskysolutions.us
2656 Electronics Way A
West Palm Beach, Florida 33407
919-771-0744
Packaging

Batteries must be packaged in a way to avoid short circuits and taped so that electrically active terminals cannot come into contact with each other. Terminals (both positive and negative) should be taped or covered. Place the battery inside a large plastic bag.

1. Valence batteries must be packed within UN-approved packaging, using one of the following two options:
   a. The original foam insert and custom box that the batteries were originally shipped in from Valence.
   b. A 4GV packaging solution that can be purchased a shipping material supplier like U-line.

2. The carton must comply with related hazmat regulations regarding labeling, and include all of the following items (See Figure 1):
   a. A reasonably clean/undamaged Class 9 diamond-shaped label
   b. An address label showing origin and destination
   c. "UN3480 Lithium Ion Batteries" must be on the carton

Always use ground services to ship batteries. Never use air services to ship batteries accumulated for recycling for safety reasons, as such shipments are prohibited by regulation (see e.g., IATA Dangerous Goods Regulations, Special Provision A154).

_Shipments requiring Hazardous-Materials Handling are to be contracted by Haz-Mat shippers only._

If you don’t have a scale to weigh the battery, refer to our U-Charge Module List on the next page to get the weight of the module you are shipping.

Include one copy of our Material Safety Data Sheet (also available on our website) per shipment.
<table>
<thead>
<tr>
<th>Specifications</th>
<th>U1-12RT</th>
<th>U1-24RT</th>
<th>U1-12XP</th>
<th>U24-12XP</th>
<th>U27-12XP</th>
<th>UEV-18XP</th>
<th>U27-36 XP</th>
<th>po4wer® P40-24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Module Voltage</td>
<td>12.8 V</td>
<td>25.6 V</td>
<td>12.8 V</td>
<td>12.8 V</td>
<td>12.8 V</td>
<td>19.2 V</td>
<td>35.4 V</td>
<td>25.6 V</td>
</tr>
<tr>
<td>Nominal Capacity (C/5, 23°C)</td>
<td>40 Ah</td>
<td>20 Ah</td>
<td>40 Ah</td>
<td>110 Ah</td>
<td>138 Ah</td>
<td>69 Ah</td>
<td>46Ah</td>
<td>40 Ah</td>
</tr>
<tr>
<td>Weight (approximate) kg</td>
<td>6.5 kg</td>
<td>6.4 kg</td>
<td>6.5 kg</td>
<td>16.5 kg</td>
<td>19.5 kg</td>
<td>14.9 kg</td>
<td>19.5 kg</td>
<td>16.5 kg</td>
</tr>
<tr>
<td>Weight (approximate) lbs</td>
<td>14.3 lbs</td>
<td>14.1 lbs</td>
<td>14.3 lbs</td>
<td>34.8 lbs</td>
<td>42.9 lbs</td>
<td>32.8 lbs</td>
<td>45.3 lbs</td>
<td>35.3 lbs</td>
</tr>
<tr>
<td>Dimension incl. Terminals LxWxH (mm)</td>
<td>197x131x183</td>
<td>197x131x183</td>
<td>197x131x183</td>
<td>260x172x225</td>
<td>308x172x225</td>
<td>269x148x245</td>
<td>306x172x225</td>
<td>256x165x260</td>
</tr>
<tr>
<td>Dimension incl. Terminals LxWxH (Inches)</td>
<td>7.78x5.19x7.20</td>
<td>7.78x5.19x7.20</td>
<td>7.78x5.19x7.20</td>
<td>10.2x6.77x8.86</td>
<td>10.2x6.77x8.86</td>
<td>10.2x6.25x9.35</td>
<td>12.0x6.77x8.86</td>
<td>9.76x6.49x10.2</td>
</tr>
<tr>
<td>DC Group/Number</td>
<td>U1R</td>
<td>U1</td>
<td>U1R</td>
<td>Group 24</td>
<td>Group 27</td>
<td>n/a</td>
<td>Group 27</td>
<td>n/a</td>
</tr>
<tr>
<td>Terminals, Female Threaded</td>
<td>M8 x 1.0</td>
<td>M8 x 1.0</td>
<td>M8 x 1.25</td>
<td>M8 x 1.25</td>
<td>M8 x 1.25</td>
<td>M8 x 1.25</td>
<td>M8 x 1.25</td>
<td>M8 x 1.25</td>
</tr>
<tr>
<td>Specific Energy</td>
<td>79 Wh/kg</td>
<td>60 Wh/kg</td>
<td>79 Wh/kg</td>
<td>59 Wh/kg</td>
<td>91 Wh/kg</td>
<td>59 Wh/kg</td>
<td>91 Wh/kg</td>
<td>Specific Power &gt;500 W/kg (10 s)</td>
</tr>
<tr>
<td>Energy Density</td>
<td>110 Wh/ml</td>
<td>110 Wh/ml</td>
<td>110 Wh/ml</td>
<td>114 Wh/ml</td>
<td>148 Wh/ml</td>
<td>124 Wh/ml</td>
<td>148 Wh/ml</td>
<td>Power Density &gt;1200 W/l (10 s)</td>
</tr>
<tr>
<td>Standard Discharging 25°C</td>
<td>30 A</td>
<td>30 A</td>
<td>80 A</td>
<td>60 A</td>
<td>120 A</td>
<td>300 A</td>
<td>300 A</td>
<td>200 A</td>
</tr>
<tr>
<td>Max. Continuous Load Current</td>
<td>30 A</td>
<td>30 A</td>
<td>120 A</td>
<td>60 A</td>
<td>150 A</td>
<td>150 A</td>
<td>150 A</td>
<td>120 A</td>
</tr>
<tr>
<td>Peak Load Current (30 sec)</td>
<td>80 A</td>
<td>60 A</td>
<td>120 A</td>
<td>300 A</td>
<td>150 A</td>
<td>150 A</td>
<td>200 A</td>
<td>150 A</td>
</tr>
<tr>
<td>Cut-off Voltage</td>
<td>10 V</td>
<td>20 V</td>
<td>10 V</td>
<td>10 V</td>
<td>10 V</td>
<td>10 V</td>
<td>15 V</td>
<td>15 V</td>
</tr>
<tr>
<td>Max. Charge Voltage</td>
<td>14.6 V</td>
<td>29.2 V</td>
<td>14.6 V</td>
<td>14.6 V</td>
<td>14.6 V</td>
<td>14.6 V</td>
<td>21.9 V</td>
<td>43.8 V</td>
</tr>
<tr>
<td>Float Voltage Recommended C/2</td>
<td>13.8 V</td>
<td>27.6 V</td>
<td>13.8 V</td>
<td>13.8 V</td>
<td>13.8 V</td>
<td>70 A</td>
<td>20.7 V</td>
<td>234.4 V</td>
</tr>
<tr>
<td>Standard Charging</td>
<td>13.8 V</td>
<td>27.6 V</td>
<td>13.8 V</td>
<td>13.8 V</td>
<td>13.8 V</td>
<td>70 A</td>
<td>20.7 V</td>
<td>234.4 V</td>
</tr>
<tr>
<td>Charge Time 0/2 *</td>
<td>2.5 hrs</td>
<td>2.5 hrs</td>
<td>2.5 hrs</td>
<td>2.5 hrs</td>
<td>2.5 hrs</td>
<td>2.5 hrs</td>
<td>2.5 hrs</td>
<td>2.5 hrs</td>
</tr>
<tr>
<td>DC Internal resistance (max)</td>
<td>16 mΩ</td>
<td>43 mΩ</td>
<td>16 mΩ</td>
<td>6 mΩ</td>
<td>6 mΩ</td>
<td>10 mΩ</td>
<td>26 mΩ</td>
<td>10 mΩ</td>
</tr>
<tr>
<td>Valence Part Number</td>
<td>1004461</td>
<td>1005997</td>
<td>1004434</td>
<td>1004425</td>
<td>1004428</td>
<td>1004431</td>
<td>1005190</td>
<td>1005921</td>
</tr>
</tbody>
</table>

* Consult Valence for duty cycle capabilities.